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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yasuhiko Kojima

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EXAMINER

MOORE, KARLA A

ART UNIT

PAPER NUMBER

1763

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/658,501	KOJIMA ET AL.	
	Examiner	Art Unit	
	Karla Moore	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 8-12, 15-16 and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,440,887 to Nishizato et al.

3. Nishizato et al. disclose a vaporizer which vaporizes a liquid material under a depressurized atmosphere, the vaporizer comprising: a liquid storing chamber (Figures 2 and 3, 6) temporarily storing the liquid material therein; a vaporizing chamber (13) set in the depressurized atmosphere; a small aperture (23) connecting between the liquid storing chamber and the vaporizing chamber so as to supply the liquid material to the vaporizing chamber; a vaporization valve body (7a) located on a side of said small aperture away from said vaporizing chamber so as to open and close an inlet port (in Figures 2 and 3, the inlet port is at the bottom part of structure 23) of said small aperture, said inlet port being located toward the liquid storing chamber; and an actuator (7b) controlling a degree of opening in the vaporization valve body, wherein said vaporization valve body is located outside the vaporizing chamber, and on a side opposite to said vaporizing chamber with respect to said small aperture, said vaporization valve body being located outside said vaporizing chamber, thereby permitting uninhibited flow of the

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liquid material achieving a smooth flow of vapor of the liquid material in said vaporizing chamber.

4. With respect to the limitation/recitation, “so that said small aperture is continuously open to the vaporizing chamber”, which Examiner has interpreted as an intended use, the courts have ruled that claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). In the instant case the aperture is capable of being opened. So, to have it opened continuously is possible and would depend on a method to be carried out in the apparatus.

5. With respect to claim 2, Nishizato et al. further comprises carrier gas introducing means (Figure 3, 14) for introducing a carrier gas into the vaporizing chamber.

6. With respect to claim 3, the carrier gas introducing means injects the carrier gas in the vicinity of an outlet port (in Figures 3 and 5, the outlet port is at the top part of structure 23) of the small aperture.

7. With respect to claims 4 and 5, the carrier gas introducing means includes an injecting port positioned in the vicinity of the outlet port of the small aperture so as to inject the carrier gas from a surrounding area of the outlet port in a direction substantially perpendicular/substantially opposite of a flow of the liquid material from said inlet port to said outlet port of said small aperture. See Figures 3 and 5.

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8. With respect to claim 8, a direction of a flow of the liquid material from said inlet port to said outlet port of said small aperture coincides with a direction of an exit of the vaporizing chamber. See Figures 2-3 and 5.
9. With respect to claim 9, the vaporizer further comprises a heater (Figure 4, 42) provided in a periphery of the vaporizing chamber and a temperature sensor (Figure 4, 41) detecting a temperature of the periphery of the vaporizing chamber. Also, see column 4, rows 45-57.
10. With respect to claim 10, the vaporizer further comprises a heater (Figure 4, 42) provide near the liquid storing chamber for heating the liquid material in the liquid storing chamber and a temperature sensor (Figure 4, 41) positioned in the vicinity of an outlet port of the small aperture. Also, see column 4, rows 45-57.
11. With respect to claim 11, which is a drawn to a material to be used during an intended method using the apparatus, the courts have ruled that expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).
12. With respect to claim 15, a diameter of said small aperture is equal to or less than 2mm (column 6, rows 24-27).
13. With respect to claim 16, a diameter of said small aperture falls within a range of from 0.5 to 2 mm.
14. With respect to claim 12, Nishizato et al. also disclose a semiconductor manufacturing system comprising: a process apparatus (Figure 1A, 50) performing a process using a vaporized material; and a vaporizer which vaporizes a liquid material under a depressurized atmosphere so

as to generate the vaporized material, the vaporizer comprising: a liquid storing chamber (Figures 2 and 3, 6) temporarily storing the liquid material therein; a vaporizing chamber (13) set in the depressurized atmosphere; a small aperture (23) connecting between the liquid storing chamber and the vaporizing chamber so as to supply the liquid material to the vaporizing chamber; a vaporization valve body (7a) located on a side of said small aperture away from said vaporizing chamber so as to open and close an inlet port (in Figures 2 and 3, the inlet port is at the bottom part of structure 23) of said small aperture, said inlet port being located toward the liquid storing chamber; and an actuator (7b) controlling a degree of opening in the valve body, wherein said vaporization valve body is located outside the vaporizing chamber, and on a side opposite to said vaporizing chamber with respect to said small aperture, said vaporization valve body being located outside said vaporizing chamber, thereby permitting uninhibited flow of the liquid material achieving a smooth flow of vapor of the liquid material in said vaporizing chamber.

15. With respect to claim 21, the vaporizer further comprises carrier gas introducing means (Figures 3 and 5, 14) for introducing a carrier gas into the vaporizing chamber, wherein the carrier gas introducing means injects the carrier gas in the vicinity of an outlet port of the small aperture, and a direction of the carrier gas is different from a direction from the inlet port to the outlet port of said small aperture (see Figures 3 and 5).

16. With respect to claim 22, Nishizato et al. further disclose a vaporizer which vaporizes a liquid material under a depressurized atmosphere, the vaporizer comprising: a liquid storing chamber (Figures 2 and 3, 6) temporarily storing the liquid material therein; a vaporizing chamber (13) set in the depressurized atmosphere; a small aperture (23) connecting between the

liquid storing chamber and the vaporizing chamber so as to supply the liquid material to the vaporizing chamber; a valve body (7a) located on a side of the liquid storing chamber with respect to said small aperture so as to open and close an inlet port (in Figures 2 and 3, the inlet port is at the bottom part of structure 23) of said small aperture which opens in the liquid storing chamber and also to control an amount of the liquid material being supplied to said vaporizing chamber by controlling a degree of opening of the inlet port of said small aperture; and an actuator (7b) controlling a degree of opening of the valve body, wherein said vaporization valve body is located outside the vaporizing chamber, and on a side opposite to said vaporizing chamber with respect to said small aperture, said vaporization valve body being located outside said vaporizing chamber, thereby permitting uninhibited flow of the liquid material achieving a smooth flow of vapor of the liquid material in said vaporizing chamber.

17. With respect to claim 23, Nishizato et al. also disclose a semiconductor manufacturing system comprising: a process apparatus (50) performing a process using a vaporized material; and a vaporizer which vaporizes a liquid material under a depressurized atmosphere so as to generate the vaporized material, the vaporizer comprising: a liquid storing chamber (Figures 2 and 3, 6) temporarily storing the liquid material therein; a vaporizing chamber (13) set in the depressurized atmosphere; a small aperture (23) connecting between the liquid storing chamber and the vaporizing chamber so as to supply the liquid material to the vaporizing chamber; a vaporization valve body (7a) located on a side of the liquid storing chamber with respect to said small aperture so as to open and close an inlet port (in Figures 2 and 3, the inlet port is at the bottom part of structure 23) of said small aperture which opens in the liquid storing chamber and also to control an amount of the liquid material being supplied to said vaporizing chamber by

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controlling a degree of opening of the inlet port of said small aperture; and an actuator (7b) controlling a degree of opening of the valve body, wherein said vaporization valve body is located outside the vaporizing chamber, and on a side opposite to said vaporizing chamber with respect to said small aperture, said vaporization valve body being located outside said vaporizing chamber, thereby permitting uninhibited flow of the liquid material achieving a smooth flow of vapor of the liquid material in said vaporizing chamber.

18. With respect to claim 24, Nishizato et al. disclose a vaporizer which vaporizes a liquid material under a depressurized atmosphere, the vaporizer comprising: a liquid storing chamber (Figures 2 and 3, 6) temporarily storing the liquid material therein; a vaporizing chamber (13) set in the depressurized atmosphere; a small aperture (23) connecting between the liquid storing chamber and the vaporizing chamber so as to supply the liquid material to the vaporizing chamber; a vaporization valve body (7a) located on a side of said small aperture away from said vaporizing chamber so as to open and close an inlet port (in Figures 2 and 3, the inlet port is at the bottom part of structure 23) of said small aperture, said inlet port being located toward the liquid storing chamber; and an actuator (7b) controlling a degree of opening in the valve body, wherein said vaporizing chamber lacks obstacles including said vaporization valve body, thereby achieving a smooth flow of vapor of the liquid material in said vaporizing chamber.

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
21. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizato et al. as applied to claims 1-5, 8-12, 15-16 and 21-24 above, in view of U.S. Patent No. 6,224,681 to Sivaramakrishnan et al.
22. Nishizato et al. disclose the invention substantially as claimed and as described above.
23. However, Nishizato et al. fail to teach the valve body formed by one of a diaphragm and a bellows.
24. Sivaramakrishnan et al. teach the use of a valve body comprising one of a diaphragm or a bellows for the purpose of controlling liquid flow (column 3, row 60 through column 4, row 6).
25. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a valve body comprising one of a diaphragm and a bellows for the purpose controlling liquid flow as taught by Sivaramakrishnan et al.

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26. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizato et al. as applied to claims 1-5, 8-12, 15-16 and 21-24 above, in view of U.S. Patent No. 5,776,254 to Yuuki et al.

27. Nishizato et al. disclose the invention substantially as claimed and as described above.

28. However, with respect to claim 7, Nishizato et al. fail to teach the vaporizing chamber having a conical shape so that a cross section of the vaporizing chamber increases as a distance from the small aperture increases.

29. With respect to claim 20, the central axis of said vaporizing chamber coincides with a direction from the inlet port to an outlet port of said small aperture. However, Nishizato fail to teach the vaporizing chamber having a conical shape so that a cross section of the vaporizing chamber increases as a distance from the small aperture increases.

30. Yuuki et al. teach the use of a vaporizing chamber having a conical shape so that a cross section of the vaporizing chamber increases as a distance from the small aperture increases for the purpose of quickly and effectively vaporizing particles supplied to the vaporizer so that liquid material does not stagnate in piping (Figure 7, 4; column 15, rows 10-16).

31. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided as taught by Yuuki et al.

32. Claims 13-14 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizato et al. as applied to claims 1-5, 8-12, 15-16 and 21-24 above, in view of U.S. Patent No. 4,847,469 to Hofmann et al.

33. Nishizato et al. disclose the invention substantially as claimed and as described above.

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34. However, Nishizato et al. fail to disclose the exact dimensions of the vaporizing chamber, as recited in claims 13-14 and 18-19.

35. Hofmann et al. teach that the sizing of a vaporization chamber for supplying a processing gas to a deposition chamber is scalable based on the size of the deposition chamber (column 6, rows 5-11).

36. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a vaporizing chamber with appropriately scaled dimensions as dictated by the deposition chamber to which it is supplying a processing gas as taught by Hofmann.

37. Examiner also notes that the courts have ruled that where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

38. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizato et al.

39. Nishizato et al. disclose the invention substantially as claimed and as described above.

40. However, Nishizato et al. fails to explicitly teach a length of said small aperture is equal to or less than 5 mm.

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41. Nishizato et al. do however clearly teach that the dimensions of the small aperture are minimized in an effort to reduce the volume of the aperture so that the amount of bubble produced is also reduced (column 6, rows 18-30).

42. The courts have ruled that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

43. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an aperture with further minimized dimensions as suggested in Nishizato et al. in order to reduce the amount of bubbles produced as taught by Nishizato et al.

Response to Arguments

44. Applicant's arguments filed 28 September 2006 have been fully considered but they are not persuasive.

45. As described above, the newly added recitation regarding the state of the small aperture is considered a recitation based on an intended use of the apparatus.

46. With respect to claim 24, which recites that said vaporizing chamber lacks obstacles including said vaporization valve body, thereby achieving a smooth flow of vapor of the liquid material in said vaporizing chamber, Examiner notes that when valve body (12a) is in an open position as illustrated in Figure 5, the vaporization chamber lacks obstacles including said vaporization valve body (i.e. the chamber is not blocked), thereby achieving a smooth flow of

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vapor of the liquid material in said vaporizing chamber. The liquid enters the chamber is vaporized and then achieves a smooth flow as depicted in Figure 5.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Karla Moore
Primary Examiner
Art Unit 1763
21 December 2006